

**ABSTRACT OF THE DISCLOSURE**

A photocatalytic coating oxidizes volatile organic compounds that adsorb onto the coating into water, carbon dioxide, and other substances. When photons of the ultraviolet light are absorbed by the coating, reactive hydroxyl radicals are formed. When a contaminant is adsorbed onto the coating, the hydroxyl radical oxidizes the contaminant to produce water, carbon dioxide, and other substances. Humidity has an effect on the photocatalytic performance of the titanium dioxide coating. Water adsorbs strongly on the coating, and water and contaminants compete for adsorption sites on the coating. A magnetron emits microwaves of the desired wavelength. The microwaves are only absorbed by the adsorbed water, desorbing the water from the photocatalytic coating and creating additional photooxidation sites for the contaminants.

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